



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

7.

Vixi quod volui, volui quod Fata vole-
bant,
Nec mihi vita brevis, nec mihi longa fu-
it.

8.

Phillippus Verheyen, Medicinæ Doctor
et Professor, partem sui materialem, hic
in cæmeterio condi voluit, ne templum
dehonestaret, aut nocivis halitibus infi-
ceret. Requiescat in pace.

9.

Salubritatis et voluptatis causa,
Hoc salictum
Paludem, olim, mihi meisque infidum,
Exsicco et orno,
Hic, procul negotiis, strepituque,
Innocuus deliciis,
Silvulas inter nascentes reptandi
Fruniscor.
Hic, si faxit Deus optimus maximus,
Cum quodam juvenutis amico superstite,
Sæpe conquiescam senex,
Contentus modicis, meoque lætus;
Sin aliter...
Ævique paululum superserit,
Vos silvulæ, et amici, cæteræque voluptates
Valete!
Diuque Lætamini.

10.

Hic abavis, -atavis, et avo, sic patre crea-
tus,
Presbyteris sanctis, Presbyter ipse jacet,

Annos si spectes juvenum flos excidit : at
si
Aut studia, aut mores, transiit ille senex.

11.

Eheu, liberi optimi!...sed non posterî.—

12.

Laudatam tentas Hadriam, lustrare, viator,
Sed tumulata jacet, propriusque sepulta ru-
inis;
Heu! Fuit; et tantum superest informe ca-
daver;
Ergo viator, abi : cogitaque quod ipse ja-
cebis.

TO SLEEP.

SOMNE levis! quamquam certissima mor-
tis imago,
Consortem cupio te tamen esse tori;
Alma quies, optata veni; nam sic sine vita,
Vivere quam suave est, sic sine morte mor-
ri.

TRANSLATED.

SLEEP! though death thou dost resemble,
Still I court thy shadowy aid;
Fear nor Hope shall make me tremble,
In thy lap oblivious laid.

Then, while on my pillow lying,
Envied Bliss, O let me share,
Death, without the pangs of dying;
Life, without its load of care.

USEFUL INVENTIONS.

*Patent of Wm. Watts, of Bath, gen-
tleman, for new combinations of
Machinery for Wind-Mills, Water-
Mills, and Mills moved by Cattle.
Dated Sept. 1809.*

IN Mr. Watt's wind-mill two drum-
wheels or cylinders are placed pa-
rallel to each other, having their axis
in the same horizontal plane, at some
distance asunder, over which work
two endless chains connected at
equal intervals by bars, on which
an equal number of sails are made
to stand erect by square frames
united to them, which are sup-
ported in an upright position by

braces, two of which proceed from
near the top of each to the bar
next before it. The axles of the
drum wheels move in a frame-
work capable of being turned round
horizontally, like the top of a com-
mon wind-mill, by which means,
the line of sails, which rise above
it, can be turned to the wind with
that degree of obliquity, which
will be found to produce the great-
est effect. The above is the prin-
cipal outline of Mr. Watt's wind-
mill, but some other matters are
added for its further improve-
ment; of which the chief is, the
addition of two springs to each sail,

to equalize the irregular action of the wind, which springs are made to act, by each sail being placed in a second frame, moveable on a hinge at the bottom of each of those frames before described, and having cords passed from the upper extremities of this moveable frame through pulleys in the tops of the upright frames, and proceeding thence to the springs, which are placed at the bottom of the latter frames near the cross bars.

The under sails being sheltered from the wind, and the upper ones, receiving it in an angle between each other, they pull round the drum-wheels, to the shafts of which is connected the manufacturing machinery.

The width of the sails, and their distances from each other, must be so regulated, that the wind may strike them sufficiently at the same time, so as not to make the angle of the line of sails with the wind too great.

Only eight sails are represented in action, in the drawing accompanying the specification, but the number is not limited; the power may be much increased by making the distance from drum to drum greater, and adding sails in proportion. Adding length to the sails increases the power in proportion to the increase of sail, without losing time, which is not the case in the present vertical mills. The sails must be made full, to form a concave surface to the wind.

The machinery for a floating tide mill, or current mill, is similar to that above described; its floats may be made of wrought iron, wood, or other materials, and should in general be broader than deep, and as in the sails of the wind-mill, must form a concave surface to the current, if this runs only one way, the concave side of the float may be sta-

tionary; but if it runs both ways, which happens with tides, the floats are made to turn on a pivot in the centre above and below the frame. The machinery is placed at a proper angle with the current between two boats, connected together by a strong framing, which may be fixed between the upper and lower line of floats. The boats are placed parallel with the current, and the floats (as represented in the drawing,) pass obliquely from the bow of one boat to the stern of the other. The number of floats is not limited, the more that can be got to work, *ceteris paribus*, the greater will be the power, which will also be increased by making the floats as deep as the current will admit.

The drum-wheels, chains and cross bars (or axles,) are the same as for the wind-mill; but as water is a steadier power than wind, springs are not required for the floats.

Mr. Watts also mentions as his invention, the working a mill by a fall of water operating on a chain of buckets, passing over a drum-wheel above, and under rollers at the bottom: and has given particular directions for the formation of the links and points of the chain connected with the buckets, which may be of some use to those who desire to construct a mill of this kind.

The machinery for cattle mills, which the patentee likewise states to be his invention, is formed by a connection of planks united by joints, having at their ends wheels travelling in a channel of the framing, and round two drum wheels, to the axles of which may be fixed the manufacturing machinery.

The cattle drawing from a fixed point, in pulling round the drum

L11

wheels with the machinery, work constantly in a straight line, by which means they move much faster, with much more ease, and perform much more work, than when constrained to travel round a circle.

In a note at the end of the specification, the patentee observes, that there is in appearance some similarity between his plan of working mills by a fall of water, and a method published several years ago by Dr. Desaguliers; but that the doctor's method is defective, the frictions and obstructions operate too much against the power gained, and though in great falls the disadvantages are less in proportion, they are too great for it to be of any general utility.

Observations...According to the ancient adage, *Nihil est simile sibi*, Mr. Watt's method of working mills by a fall of water, cannot be like that described by Dr. Desaguliers, for it is the very method itself, nor has the patentee mentioned the smallest particular that give him the least claim to the plan, which has all the advantages he has stated it to possess in his specification; but even this statement, it is probable, he borrowed, as well as the invention, for the writer of this article, published in the Repertory of Arts, No 39, for Aug. 1805, "A comparison of the power of the common water mill wheel, with that of the engine constructed for the same purpose by M. Francis, in 1668," (which is the one above mentioned, described by Dr. Desaguliers,) in which paper all that Mr. Watts has said of the advantages of this invention was fully stated.

This gentleman has not confined his invasion of the inventions of others to the above instance, what he calls *his* machinery for cattle mills, is also copied exactly from a

patent of Mr. Anthony George Eckhardt, published in the Repertory of Arts, vol. 2 p. 360, and dated, January, 1795.

The articles recited which seem original, are the wind-mill, and the tide-mill; the latter would probably succeed in producing a considerable power in proportion to the current; but there seems to be no necessity for using two boats for it, and that it might be managed in one boat in a much less complicated manner, and so as to be much less exposed to accidents from floods, or from boats or timber floating down the stream.

Wind being less regular in its movement than water; would occasion the wind-mill described to perform worse than the water-mill; and it seems probable that the line of sails would be so subject from this cause, to be shaken back and forwards laterally, and in various other directions, that the chains would be soon broken, and the machinery destroyed. This kind of wind-mill would be also much more complicated than one of the common sort, and would greatly exceed it both in its first cost, and in the expense of repairs.

The uncertainty of the force of the wind, or of the time of its continuance, renders it a moving power only proper for a few operations, which may be occasionally suspended, and again resumed without any great loss; and as the demand in any trade becomes more regular and extensive, the wind is in the same proportion more unfit to work the machinery employed in it; as its cessation besides other evils, must occasion a greater loss through the interruption of the labour of those employed in the works, which it would occasion, and whose wages would still go on whether the mill worked or not.

These reasons have rendered steam engines now generally preferred, even for works for which wind-mills have been most common: and the same causes must occasion even real unequivocal improvements in wind-mills, to be matters of slight importance comparatively, much more so those, whose advantages are so counterbalanced by disadvantages, as to leave it doubtful, upon duly estimating and comparing both, to which side the balance would incline; or as in the present instance, to make it probable that the unfavourable side of the calculation would have the preponderance.

Patent of M. Frederick Albert Winsor, of Pall-mall, London, for improvements upon his former Patent Oven, for carbonising raw fuel into coke and charcoal, extracting from it oil, tar, pyroligneous acid, and ammoniacal liquor, and for producing inflammable gas purified, and deprived of all disagreeable odour; and for applying the above several products to useful purposes—dated February, 1809.

The specification of this patent commences with abusing the various apparatus' hitherto in use for producing coal gas, calling them unwieldy, costly and dangerous, unfit for private houses or lighting streets, and praising his own for operating diametrically contrary to all the others, which are enumerated by name, as follows: the apparatus of Messrs. Murdock, Boulton, Watt & Co. of Soho; that of Messrs. Phillips, Lee & Co. Manchester; that of Mr. Cook, Birmingham; and those of Mr. Davis of Tanley Moor, and of Mr. Parkes, mentioned in his chemical catechism; of these the patentee states what he supposes their defects; and proceeds to describe his own appa-

tus; which after all this preface the reader would be led to suppose, was something very clever; but in this he will be rather disappointed. The stoves for producing the gas are thus described by the patentee.

"House and chamber stoves may be constructed of iron or other metal, of earthen or stone-ware, made fire-proof, of pipe clay, or any other fire-proof composition. Their form in general, is that of the German draft stoves, but they may be made also of various other shapes; and the cylinder which separates the fire from the coal inside, may be made equally different in shape, provided that its bulk occupies from one-third to one-half of the area within the stove, so that the heat may more equally be distributed among the surrounding coal or fuel; for instead of surrounding any iron or other re-torts filled with coal or other fuel, by a large fire, I place my fires in the centre of the vessels charged with raw fuel; and I employ the refuse coke and coal only to burn in those cylinders, or iron cones surrounded by said raw fuel; hence the fire and heat generated in the centre expand by the laws of nature in all directions, but chiefly upwards and sideways, and a much greater quantity of caloric is thus generated by means of a good draft, and is more equally distributed among the coal, so as to cause a speedier and more perfect carbonisation."

The patentee after this recounts, what he considers the imperfections of the common methods of applying the heat to the gas-ovens, from which his are free; and then states, "that by his method, one third of a bushel of refuse coke may generate sufficient caloric to carbonise a whole bushel of coal, so as to produce one bushel and a half of good coke again, besides from five to six pounds of oil tar, from seven to eight pounds of strong ammoniacal liquor, and

from 220, to 360 cubic feet of pure gas.

After mentioning some uses of the above substances, which are all commonly known, the patentee further states of his apparatus: "that the cylinders or cones, containing the fires may be so constructed as to give a horizontal, perpendicular, oblique, serpentine, or reverberating direction, to the fire or flame, in its passage through the raw fuel or other combustibles to be analysed; the heat and flame may be led up, and downwards, to the right, and left, and in all possible directions through the carbonising fuel; for the longer the fire draft is detained in its passage, and the greater the circuit it makes through the fuel, the sooner, and the better will the process of carbonisation be effected, and the better will be the quality of the products precipitated in the condensers.

The patentee next describes his apparatus for large works thus: "In my large succession stoves, principally made of fire and other bricks, divided into several compartments, and closed with iron covers, the fires run from one, two, three, four, or more grates through a number of flues in the midst of coal, and meet in the centre at one chimney; these compartments are either larger or smaller, to hold from one peck to one sack, or more, of coal or other fuel; and are charged and discharged in succession, without in the least interrupting the process of the other compartments, so that the operation of the furnace goes on day and night without any hindrance. From each compartment, a separate flue, or conductor carries the raw smoke to the great main connected with the condensor, so that when one of them is discharging of coke, to be recharged with coal, &c. the communicating flue, or tube, to the main is shut by a cock or valve,

in order to prevent the access of air to the great main; but as soon as charged and covered in, the communication to the main is restored, that the raw smoke may freely pass to the condensor. In this manner furnaces of any dimensions may be constructed; and good coke may be made, even of the refuse or siftings of coal, if forms of iron, clay, or wire like a frame work, are filled with small coal, and placed within these compartments; this coke will make good coke-cakes of any size or shape, by which means the breakage, and its waste is avoided. The condensor, which is the next principal part of the machine, cools the hot smoke and gas much speedier and more perfect than gasometers, where it is retained in large volumes; whereas, to perform a complete analysis, it should be as minutely subdivided as possible; for this purpose my chamber-stoves have metal, earthen, or stone vessels made in form of a pedestal, or any other convenient figure, to support them: these vessels have several subdivisions or partitions filled with lime water, or cream of lime, or lime diffused through them, so far as to leave only from half an inch, to two or three inches space (agreeably to the size and charge of the stoves) above the surface of the water. The lower chambers, where the tar and ammoniacal liquor collect are without water. The hot smoke from the stove, is led by a strong pipe either through or beside the fire-place and ash-hole into the lower chamber of the condensor, where it is minutely subdivided in winding round and passing through several side partitions perforated with small holes; from hence the smoke and gas strike upwards through a fixed tube on the first surface of water saturated with lime, which by its chemical affinity to sulphur, &c.

attracts those offensive particles, that otherwise accompany more or less the hydro-carbonic gas from different sorts of coal and some other combustibles; from hence the smoke is made again to ascend by a tube, and to *serpentine* again as it were in minute subdivisions through several side partitions perforated with holes, over three, four, and more surfaces of lime water, which all serve to cool, decompose, and refine it into pure gas. When it is examined by proper trying pipes, and found quite transparent, it is then suffered to force its way through the main, and side tubes, towards the spots, where the burners are fixed to give light. Proper vent must be given in time for the smoke to displace the different columns of air contained in the condensers, main tube, and side branches; first, by the trying pipes near the condensor, secondly, by those of the main, and lastly, by the cocks or valves near the burners."

After a digression relative to the exhibitions at the Lyceum, Greenstreet, and Pall-mall, the patentee proceeds thus with the account of his apparatus. "Large iron stoves, and succession furnaces, have separate condensers placed at a few feet distance from them; so that they are not in the way of charging and discharging the stoves, nor of being injured by the heat. The tops of these stoves have upright ledges or shoulders, with alembic covers, to serve for evaporating or distilling tar, &c. by the same heat, and also to form a sand bath for the purpose of any other evaporation, distillation, &c. These condensers may be made of brick or stone-work, lined with lead, &c. or wholly of iron, tinplate or other metal, and even stone or earthen wares; but the cheapest and simplest are made with large wine, or other casks cut in halves,

with several bottoms made of wood or metal, in the manner above described to hold several surfaces of lime water. Should the coal be of strong quality, it will be proper to throw a small quantity of slaked lime at the bottom of the stove, sprinkled over with a little water; the steam of which will rise through the coal, and impregnate itself with the smoke, to purify it the better from the disagreeable odour. Formerly I used to mix a small quantity of lime with the coal, but this affects the coke more or less; and I find that throwing lime into the bottom of the stove answers still better, and the lime is not intermixed with the coke. Persons using reservoirs, or gas-holders, are ignorant of the effect which the pressure of the air has on the main tubes and side branches, when left open at the beginning and towards the close of the process. It is well known that the atmosphere presses with a force of fourteen pounds on every square inch of surface: hence, on an aperture of only the fourteenth part of an inch, the pressure is one pound. Now at the beginning of the process, when the gas has not yet obtained sufficient elastic force to displace the air within the tubes, although the reservoir or gasholders may be quite filled, if you attempt lighting it too soon, the blue flame will frequently be forced inwards by the superior force of the atmosphere, when it rushes with the rapidity of lightning through any length of tube into the reservoir, and explodes it with a force equal to gunpowder; hence, the larger the reservoir, the greater the danger. The same effect must take place towards the close, when the elastic pressure of the gas must become inferior to that of the atmosphere; and where-soever there is a flame left burning, accidents are likely to happen, as

the cause of danger still exists the same as in gunpowder mills, which may stand safe for years and be blown up at last. No human ingenuity can prevent the explosion of gas where it is suffered to accumulate in any quantity, for it is impossible to guard against it with any safety valves, or other contrivances, as is done with steam engines; the bursting of which depends on different principles."

The patentee concludes, with stating, "that the principle of placing a fire in the centre, may be applied to heat or boil, distil or evaporate water or other liquids, in wooden casks, or other vessels, much sooner than can be done in the common mode of applying the heat under and around the vessels used for these purposes. It may also be applied for airing, drying, baking, stewing, &c. In any of the fire-places in my stoves and furnaces, a strong metal, or fire proof composition tube may be led through the middle, supplied with fresh air by a tube connected with the outside, through the wall. By this means a great quantity of fresh air may be speedily rarified, heated, and be conducted by other tubes, fixed and flexible, to warm rooms, and even whole houses, in a far superior and safer manner than can be done by steam, or the fire flues now in use."

Observations....This patent has excited considerable attention, on account of the act of Parliament, passed a few months ago, establishing, or chartering a company with a large capital, and the liberty of transferring shares, for carrying into effect Mr. Winsor's method of producing coal gas, and applying it to various useful purposes, which method it was expected would be explained in the specification of this patent, and for this reason, copious extracts from it are here inserted.

It does not appear that the me-

thod of heating the gas-oven, by a fire-place made in its centre, which is so much extolled by the patentee will be so advantageous as he asserts; for it has been proved by well known and accurate experiments, by Count Rumford and others, that heat is communicated but in a very small degree downwards, and very little more sideways, and therefore that the ascending heat is that which it is alone material to attend to; in heating solid substances in close vessels, this takes place even more than with fluids; as no intestine motion occurs in them as in the latter, to distribute the heat to the parts more remote from the fire; besides this, from a gas furnace constructed with the fire-place in the centre of the oven, it would be very difficult to extract the coke; and still more so if furnished with the numerous pipes which, the patentee mentions, should "*serpentine*" through it. For the reason stated, it is probable that gas-ovens with the heat applied beneath their bottoms alone, would be found as efficacious as any, while they would be much simpler and more easily constructed.

The gas reservoir, which is the other chief part of the apparatus of the patentee, from his own statement is not merely objectionable, but extremely dangerous, as the frightful account which he has given of the risk of explosion, in producing the gas, applies solely to his own apparatus; for though he has asserted (with that unqualified boldness for which foreigners are so remarkable) "that no human ingenuity can prevent, or guard against explosions of this nature; estimating all ingenuity by his own; yet this is not only very possible, but has been done almost from the first, by Mr. Murdock, (the original inventor of the extensive application of coal gas to useful purposes) by the simple contrivance of a gas-holder, balanced

by a weight, and suspended in a cistern of water; which always has a tendency to sink when not kept up by the gas forced into it by the action of the furnace, and which consequently always drives the gas outwards, whenever the cocks are opened to admit its escape, and thereby effectually prevents the admission of air through the pipes, at the commencement and termination of the operation; from which the patentee, with some reason, apprehends such alarming accidents; and a satisfactory proof of its perfect adequacy for this purpose arises from the fact, that we have no account of the smallest explosion having occurred in any gas apparatus where the balanced gas-holders mentioned were used; and moreover the security which this contrivance gives, is considered so complete, that it has never been thought worth while to add valves where the gas departs from the gas-holder, to prevent its return; a most obvious means for this purpose, though thought by the patentee to be impossible.

But though this apparatus so pompously announced, instead of surpassing those previously made, is inferior to most of them, and though the patentee cannot be permitted to assume the station of first inventor of the application of coal gas to useful purposes, which he so earnestly strove to effect; yet he must be allowed the merit of having greatly

contributed to excite general attention to this useful contrivance, and to give it the extensive notice it now possesses, which but for him, it is probable for a long period hence, it would not have attained.

If the merit of the different persons, who have applied themselves to the construction of apparatus for making coal gas, was estimated, that of each would probably be found to arise from the following considerations.

Mr. Muddock has the merit of being the first who invented and constructed an extensive apparatus for coal gas.

Mr. Cook, of Birmingham, was the first who brought the plan within the reach of the lesser artificers, fitted it for small works, and applied it to supply soldering lamps, and those for working glass ornaments.

Mr. Clegg, of Manchester, was the first who gave the public accurate plans, and drawings of the apparatus, for extensive purposes, which plans may be seen in the 26th vol. of the transactions of the society of arts.

And Mr. Winsor by his lectures, advertisements, patents, extraordinary plan for a gas company with a vast capital, and his act of parliament, has most brought the invention into notice, and contributed to its present extensive publicity.

LIST OF NEW PUBLICATIONS.

CLASSICS.

THE original text of Juvenal and Persius cleared of the most exceptionable Passages, with Notes, &c. by Rev. Edward Owen, M.A. 5s.

Ciceronis Opera Omnia ex recensione, To Aug. Ernesti, Notis adjunctis; 8 vols. 6l.

HISTORY.

The Chronicle of the Kings of Britain; Translated from the Welsh Copy,

attributed to Tysilio; by Peter Roberts, A.M. 2l. 2s.

The first part of the History of Ancient Wiltshire, 4l. 4s.

LAW.

A new Edition of Burn's Justice, being the 21st, with many Additions, 16s.

The Principles and Law of Tithing; by F. Plowden, esq. Barrister, 16s.

A familiar explanation of the law of Wills; by T. E. Tomkins, Barrister, 3s. 6d.